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Pacific Southwest Forest and Range
Experiment Station - Berkeley, California
Forest Service - U. S. Department of Agriculture

U. S. FOREST SERVICE RESEARCH NOTE PSW-1 1963

DELAYED SPROUTING OF SCRUB OAK AFTER A FIRE

By T. R. Plumb

ABSTRACT: Scrub oak at the San Dimas Experimental Forest sprouted over a two-year period following fire in 1960. Low soil moisture is believed to be the primary cause of this dormancy which complicates herbicidal control on brush conversion areas.

Scrub oak (Quercus dumosa) is an important constituent of the chaparral in southern California. It is noted for its hardiness and its ability to resprout soon after top removal by wildfire or hand cutting. This note describes another aspect of its character--the ability to sprout after a delay of up to 2 years after wildfire.

It is amazing how rapidly new sprouts develop under favorable conditions. They may emerge and be growing vigorously 10 days after a fire (Plumb 1961). In 2 month's time some sprouts are more than 2 feet tall (fig. 1). This is true in southern California, where date of removal seems relatively unimportant. Sprouts apparently can develop at any season, except possibly during a winter cold spell. Plants normally sprout by the end of the first growing season after top removal.

At the San Dimas Experimental Forest, some scrub oak plants remained dormant for at least one growing season before producing sprouts. The delay was noted on a series of plots treated with herbicides at 2-month intervals. The first plots were sprayed in August 1961, 13 months after a fire swept over the experimental forest. Plants that normally were going to sprout should have done so by then. Many oaks had sprouts $2\frac{1}{2}$ to 3 feet tall. Some sprouts, however, were still only a few inches tall

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Figure 1.--These scrub oak sprouts, typical of regrowth that develops after top removal, had emerged and grown vigorously within 4 months after the plants were burned.

Figure 2.--Sprouts are just beginning to emerge from this plant 18 months after it was burned in July 1960.

and quite succulent. A check of the spray area a few months later revealed that a good topkill was obtained on the sprayed plants, but many plants not sprayed because they were thought to be fire-killed had subsequently produced a crop of sprouts (fig. 2). Sampling in August 1962 of plots sprayed in August 1961 indicated numbers of plants as follows:

Sprayed plants	
Dead	64
Alive	390
New, unsprayed plants	71
Fire-killed plants	30
Total	555

Delayed sprouting was noted on all plots except those sprayed in June 1962. More than half of the plants on June-sprayed areas looked as if they had sprouted just that spring. And an occasional sprout was just emerging at the time of spraying.

Soil moisture is believed to be the primary factor controlling sprouting (Miller 1947). On the experimental forest, plants along the draws and small streams produced a mass of sprouts within a month after the fire (Plumb 1961). Those on the drier sites were much slower and did not sprout until the following spring. This seems to be the normal pattern for shrubs in southern California, especially if the previous winter was fairly dry.

Rainfall in 1959-60, just before the fire, was 13.9 inches; in 1960-61, when many scrub oak plants were lying dormant, only 10.1 inches; in the 1961-62 season, 29.6 inches--about 3.3 inches more than the 34-year average. A shortage of available soil moisture probably caused a delay in sprouting, and the dormant plants sprouted when moisture became adequate.

Scrub oak's ability to remain dormant after top removal enhances its chances of survival after fire or drought. This ability to sprout any time from a few days to more than 2 years after fire also greatly complicates control of these shrubs with herbicides. There is never a time when all plants are at the right size and stage of development for spraying. Followup spraying is essential, and the job may be as big and expensive as the initial control effort.

LITERATURE CITED

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1947. Growth and environmental conditions in southern California chaparral. The American Midland Naturalist 37(2):379-420.

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1961. Sprouting of chaparral by December after a wildfire in July. U.S. Forest Serv. Pacific SW. Forest & Range Expt. Sta. Tech. Paper 57, 12 pp., illus.

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